A Green Infrastructure Plan

to Restore, Connect, and Protect South Carolina's Habitats

Planning for Green Infrastructure involves protecting and connecting the natural and cultural assets of the Lower Savannah region.

Green Infrastructure Center

FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

SOUTH CAROLINA FORESTRY COMMISSION

LOWER SAVANNAH COG Council of Governments

March 2023

Prepared for the state of South Carolina by the Green Infrastructure Center
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Executive Summary

The Lower Savannah Council of Governments (COG) region contains diverse natural and cultural resources, from blackwater rivers and nature preserves to historic plantations. Sections of the region continue to grow along I-20 and I-26 and utility-scale solar development is likely to increase across the region. While economic prosperity is vital to communities in this region, growth should occur in patterns that conserve the region's natural resources and habitats. Continuation of local efforts to conserve land, create regional partnerships, and establish ordinances and planning guidance for growth that protect green infrastructure will ensure the high quality of life of the Lower Savannah region for future generations.

The Lower Savannah COG region is in the southwest of the state, bounded on the west by the Savannah River and on the east by Lake Marion and the Congaree River. It encompasses the counties of Calhoun, Orangeburg, Bamberg, Allendale, Barnwell, and Aiken. The Lower Savannah region includes forests, wetlands, blackwater rivers, lakes, and agricultural fields. It is a predominantly rural region with significant areas of prime agricultural soil. Orangeburg and Aiken Counties are experiencing growth around Orangeburg, Aiken, and North Augusta, while utility scale solar projects have been built in Aiken and Barnwell Counties, with more likely across the region. Historic plantations, a healing spring, equestrian trails, and interactive farms contribute to a sense of place. Additionally, the Savannah River Site, a 310 mi^2 Department of Energy facility adjacent to the Savannah River in Aiken and Barnwell counties, is responsible for processing and storing of nuclear materials, waste management, environmental cleanup, and stewardship. The site contributes to the regional economy and impacts land use in the region. The North Air Force Auxiliary Field is a military facility that is part of the region's culture. Approximately 13% of the land in the Lower Savannah COG region is protected in several state parks, wildlife management areas, nature preserves, the Savannah River Site, military land, and other open spaces.

This region is the ancestral home of the Yamasee, Westo, and Congaree Native Peoples.* The Santee Indian Organization and Pee Dee Indian Nation of Beaver Creek are state recognized native groups currently living in this region.

The Lower Savannah region includes forests, wetlands, blackwater rivers, lakes, and agricultural fields.

Green Infrastructure Planning Process

This Green Infrastructure Plan comprises a set of maps and strategies for conserving and restoring a connected landscape in the state. GIC led the Lower Savannah COG and local stakeholders though GIC's Six-Step Green Infrastructure Planning Process with a series of four workshops from 2021-22. This process involved mapping habitats cores and corridors, as well as existing natural and cultural assets, followed by risk analysis to inform strategies for action. With these data, local stakeholders determined priority areas for conservation in the region, as well as strategies to ensure a connected landscape into the future. GIC followed regional COG workshops with state agency engagement. The resulting statewide plan includes statewide priorities informed by regional priorities.

This COG chapter will appear as a separate document, distinct from the full report, since it is one of ten COG chapters that have been included in the statewide assessment. The full report can be found here: https://scgiplan-gicinc.hub.arcgis.com/ or at www.gicinc.org or https://www.scfc.gov/management/urban-forestry/

The statewide scale of this project did not allow GIC to drill down to the level of county and city green infrastructure plans, but did establish important priorities for each region.

1. In the first workshop, GIC presented an overview of the project and shared a map of the region's ranked habitat cores. Feedback on the accuracy of the map and areas of development were noted and incorporated.

2. In the second workshop, GIC presented themed overlay maps that showed the region's agricultural soils, water resources, recreation, and cultural assets and asked workshop attendees to add their local input on additional assets, such as regional greenways. The final Lower Savannah asset maps and dataset included new data recommended by participants.

Lower Savannah FAST FACTS

2,538,880 acres– total COG area (3,967 mi^2)

1,304,960 acres– of habitat cores (2,039 mi^2)

51% of COG land area is habitat cores

314,880 acres– of protected cores (492 mi^2)

24% of habitat cores are protected

348,800 acres– area of protected land (cores and other) (545 mi^2)

14% of total area are protected land

8,960 acres– area of public parkland (14 mi^2)

0.4% of total land is public parkland

665,600 acres– area of habitat cores with known cultural/archaeological resources (1,040 mi^2)

413,440 acres– area of habitat cores with highest value ranking (top 5th) (646 mi^2)

378,240 acres– area of habitat cores that intersect a groundwater protection zone (591 mi^2)

599,040 acres– area of prime agricultural soils on open land (936 mi^2)

33,280 acres of wetlands (52 mi^2)

1,981 mi of 2,605 mi (76%)– miles of streams that flow within a habitat core

351 of 1,337 (26%)– of habitat cores support cultural or recreational assets

154 of 1,337 (12%)– of habitat cores support known rare, threatened, or endangered species

Lower Savannah COG

3. In the third workshop, GIC presented draft maps of risks to habitat cores in the region, including development, utility-scale solar development, and impaired waters. Stakeholder feedback about these risks was used to update and finalize the risk maps.

4. In the fourth and final workshop, GIC shared a strategy map that showed ranked habitat cores, protected lands, and regional corridors. The stakeholders then considered priority habitats and risks to those assets and recommended strategies to reduce or prevent impacts to high-value resources.

6-Step Green Infrastructure Planning Process

1. Set Your Goals What does your community value?

2. Review Data What do we know or need to know, to map identified values? Combine the state modeled data with local data.

3. Map Your Community's Ecological and Cultural Assets Based on the goals established in Step 1 and data from Step 2.

4. Assess Risk What assets are most at risk and what could be lost, if no action was taken?

5. Rank Assets and Determine Opportunities Based on those assets and risks you have identified, which ones should be restored or improved?

6. Implement Opportunities Include natural asset maps in both daily and long-range planning (park planning, comp plans, zoning, tourism and economic development, seeking easements etc.)

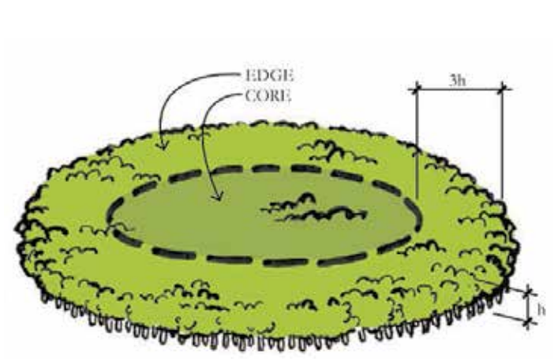
Habitat Cores

Habitat cores are intact areas of the landscape that provide adequate habitat to support native species and were modeled using source data from the 2019 National Land Cover Dataset. Habitat cores are forests, forested wetlands, and marshes at least 100 acres or more in size and are ranked using additional attributes such as water richness, topography, and the presence of rare, endangered, or threatened species. This size is large enough to provide adequate foraging and nesting habitat for interior forest dwelling birds and to support a range of other wildlife species.

Habitat cores encompass 51% of Lower Savannah COG land area.

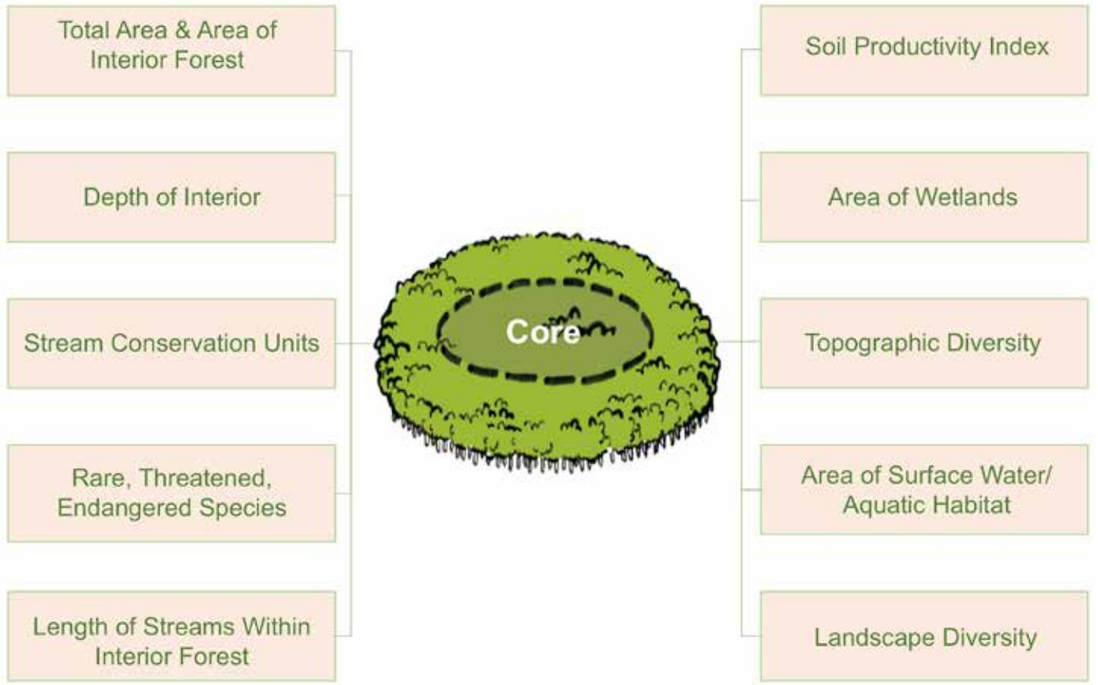
For more on how habitat cores are created, see the Methods and Maps section (page 7) and the Technical Appendix of the full report.

Ranking cores for the values they provide allows land-use planners, agency officials, and site managers to prioritize those specific habitat cores that best meet management goals and objectives, while providing the highest value for species.



Habitat cores consist of an area of intact interior wildlife habitat of 100 acres or more and an edge area that serves as a buffer absorbing impacts from outside the core.

Habitat cores are ranked based on these ecological metrics.

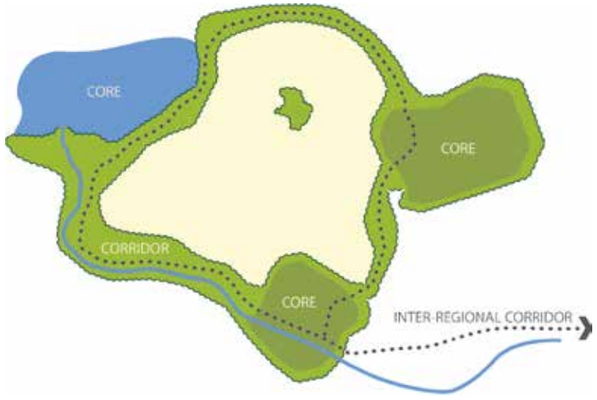


GIC modeled and mapped ranked habitat cores across both the region and state, based on ecological metrics, *see chart above*.

Corridors

Wildlife moves between habitat cores along corridors that support biodiversity by allowing species to move across the landscape and repopulate areas following such disturbances as hurricanes or fires. Restoration or preservation of corridors may also present opportunities to incorporate trails for human recreation. In addition to regional corridors, GIC modeled corridors that are of statewide importance. A graphic representation of this connectivity is displayed on the maps as state and local corridor lines. As the region continues to grow, every effort should be made to continue to maintain these corridors for a more connected and resilient landscape.

For more on corridor modeling see the Introduction section (pages 10 and 11) and the Technical Appendix of the full report.



Green Infrastructure planning is about connecting the landscape. Corridors provide connections between core habitats. A well-connected landscape is more resilient.

Lower Savannah COG

Assets

Natural Assets are the environmental elements that provide healthy surroundings, recreational opportunities, and clean water and food for both people and wildlife. These natural assets include forests, waterways, wetlands, bays, agricultural soils, and other natural resources. *Cultural Assets* are the landscape elements or uses that people value, such as parks, boat landings, trails, historic or archaeological sites, or scenic vistas and roads that add to the beauty of the area. Natural assets support cultural assets by providing scenic backdrops to historic sites, buffering them from storms and providing settings in which to enjoy them, such as the trails through historic sites that engage visitors in history while they enjoy the natural surroundings. GIC mapped these assets using existing state and national datasets, as well as data from stakeholders. The asset maps include water, agriculture, recreation, and cultural assets. Locating these assets is the first step in protecting them and allows decision-makers and planners to make more informed decisions about growth and conservation.

Risks

Mapping important habitats, agricultural soils, and cultural sites is only a first step towards planning to conserve important assets into the future. Mapping risks, in order to understand which assets are most vulnerable is the next step. GIC analyzed the following risks across the state: sea level rise, storm surge, impaired waters, development, and solar development. These risk maps can be used to determine the most critical regional risks and priority areas for conservation. Impaired waters maps can be used to determine areas to target for riparian plantings. Development and solar development maps can guide conservation efforts, as well as planning policy. Tools to mitigate risk can also include establishing solar ordinances, or drawing urban growth boundaries to avoid high-value habitat cores.

Lower Savannah Risks

28 of 1,337 (2%) habitat cores with **impaired streams**

376 of 1,337 (28%) habitat cores at risk of **development**

1,200 of 1,337 (90%) habitat cores at risk of **solar development**

1,262 of 1,337 (94%) habitat cores at **cumulative risk**

Prime agricultural soils abound across the region.

Regional Observations

The Lower Savannah region's highest quality habitat cores are found in the Savannah River Site and Savannah River Corridor. Additional high-quality cores are found in the Four Holes Swamp area, as well as along Lake Marion, the Congaree River, Edisto River, North Edisto River, South Edisto River, Salkehatchie River, and Little Salkehatchie River. The larger wildlife corridors in the region follow the Congaree River through Lake Marion, the Edisto River, and the Savannah River, and connectivity can be ensured or restored by maintaining and planting buffers and seeking protection along these rivers. Prime agricultural soils abound across the region. The region supports nature-based recreational assets, such as paddling a blackwater river, birdwatching in the Audubon preserve, and hunting at a lodge or wildlife management area. The number of assets highlighted in the maps are the result of participation by stakeholders, so those counties that participated in the process are likely to see more assets represented on the maps.

Protected land makes up 14% of the total area in the Lower Savannah COG, which is equal to the statewide rate. The Governor has adopted the 30 by 30 goal to preserve 30% of the state's lands by 2030. To achieve this goal, the region will need to double its protected lands and should continue to work with the Central Savannah River Land Trust, Aiken Land Conservancy, and other organizations to protect high-value habitat cores and corridors in the region. Currently, 24% of regional habitat cores are protected and the habitat cores and corridors map shows the most important lands that still need protection. Public parkland in the region is less than 1% of the total area, well below the 5% statewide rate and the lowest rate in the state. South Carolina Parks Recreation and Tourism and local governments should prioritize more high-quality public park space in the region and habitat cores should be a key consideration for locating future parkland.

The greatest risk for the region is development, especially suburban sprawl-patterned growth, and utility scale solar development. Urban development risks are greatest around Orangeburg, Aiken, and North Augusta and along the I-20 and I-26 corridors. Additionally, habitat cores and prime agricultural soils across the region are at risk of development for utility-scale solar farms. Planning for smart, compact growth will be critical to maintain habitat connectivity, food production capability, and quality of life in the region.

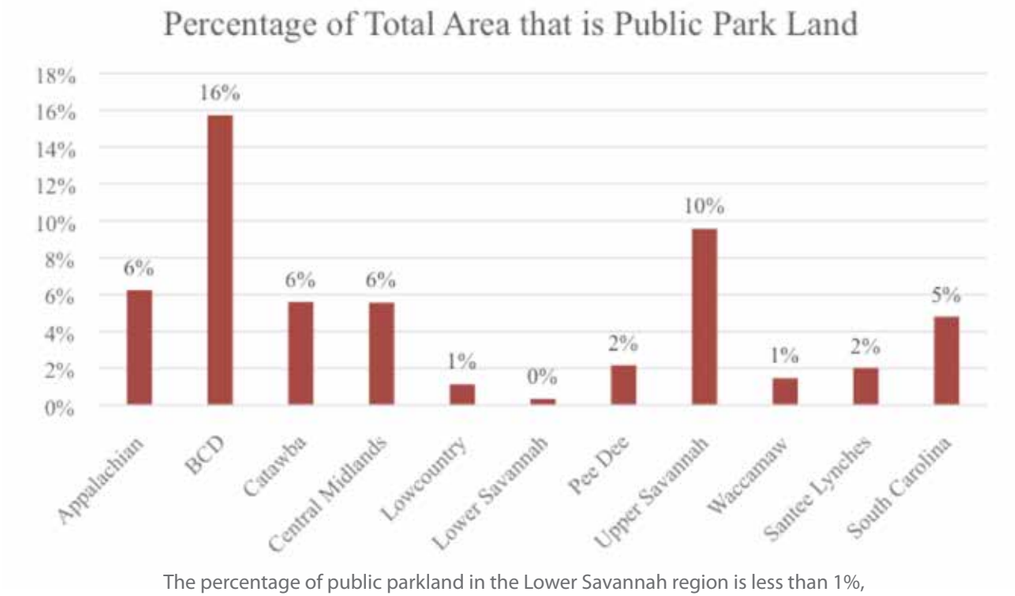
Regional Stakeholders

Participants in the Lower Savannah stakeholder workshops include representatives from:

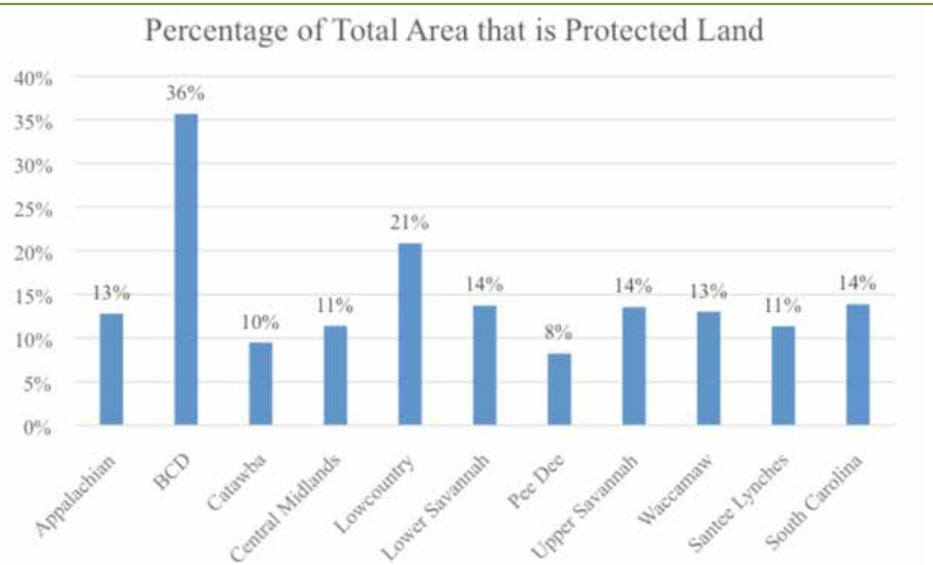
- Lower Savannah Council of Governments
- Aiken County
- Barnwell County
- Calhoun County
- Orangeburg County
- City of Orangeburg
- City of North Augusta
- Town of Blackville
- Vorhees College
- Congaree Land Trust
- Central Savannah River Land Trust
- Savannah Riverkeeper
- SC Department of Health and Environmental Control
- SC Forestry Commission

Coker Spring is a fresh water spring in Aiken. Archaeological remains found near this property suggest that this was probably a water supply for prehistoric Indians. The spring later served as the source of drinking water for the early settlers of Aiken.

Lower Savannah COG



The percentage of public parkland in the Lower Savannah region is less than 1%, well below the 5% statewide rate and the lowest rate in the state.



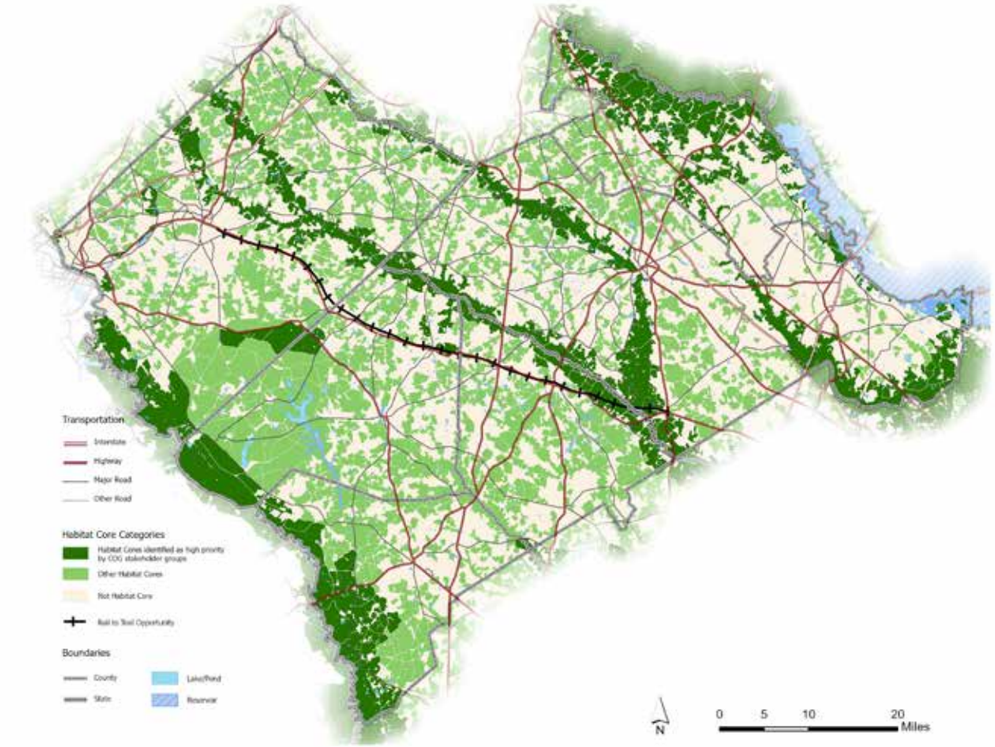
The percentage of protected land in the Lower Savannah region is 14% equal to the 14% statewide rate.

Lower Savannah Priority Areas

Lower Savannah stakeholders identified several areas in the region that are priorities for protection and restoration.

- Restore and protect water quality in the Edisto River which supplies drinking water, as well as the North Fork Edisto and South Fork Edisto corridors.
- Protect and restore connectivity to Aiken Gopher Tortoise Preserve.
- Restore and protect the Four Holes Swamp corridor for wildlife connectivity. Collaborate on this work with BCD and Lower Savannah COGs.
- Restore and protect water quality for Shaw Creek as a drinking water source.
- Restore and protect Horse Creek, west of Aiken, which may suffer impacts from development pressure.
- Restore and protect the Savannah River Corridor by reintroducing meanders removed from the Savannah River which previously allowed more water to soak into wetlands and reduced the river flow rates.
- Protect the Rocky Shoal Spider Lily community on the Savannah River near the I-20 bridge.
- Protect God's Acre Healing Springs, a culturally important source of water for the community.
- Evaluate the potential for a Rail to Trail corridor in Blackville and between Aiken and Branchville to provide recreational opportunities and restore wildlife connectivity.
- Implement wildlife crossing improvements on Route 278 over Tinker Creek when redesigning this culvert.

Lower Savannah COG Priority Areas Map



This map illustrates the habitat cores corresponding to the COG identified priority areas for protection and restoration.

Lower Savannah COG

Lower Savannah Strategies

Project maps to inform these strategies can be found at the end of this chapter as well as on the project HUB site https://scgiplan-gicinc.hub.arcgis.com/ . Users can access all the data online and download data for any county.

Strategy 1: Implement a Green Space Sales Tax.

Calhoun, Orangeburg, Bamberg, Allendale, Barnwell, and Aiken counties should consider placing the Green Space Sales Tax on their ballots to raise funds to conserve more land in the region and across county boundaries.

Strategy 2: Create and strengthen solar ordinances.

Create solar ordinances in Aiken, Orangeburg, Bamberg, and Allendale counties. Strengthen solar ordinances in Barnwell and Calhoun counties. The South Carolina Energy Office has resources for creating or updating solar ordinances and model solar ordinances.

Strategy 3: Connect protected lands.

Connect public protected lands by targeting protection of corridors between these properties. For example, target the protection of land on the South Fork Edisto River between Aiken Gopher Tortoise Preserve and Aiken State Park.

Strategy 4: Utilize data and maps in Aiken County's Comprehensive Plan update.

Use the maps and data from the Green Infrastructure Plan to inform on Aiken County's 2024 Comprehensive Plan update, with a focus on protecting natural assets.

Strategy 5: Use Green Infrastructure Plan data and maps in all upcoming county comprehensive plan updates.

The Lower Savannah COG should utilize data and maps from this Green Infrastructure Plan to inform upcoming comprehensive plan updates, in order to conserve natural assets.

Strategy 6: Increase buffer requirements in Aiken County.

Aiken County should require buffers on all streams. The buffer requirements should be widened to have the most impact on water quality and habitat connectivity.

Strategy 6: Use cores and corridors data in bike and pedestrian planning.

COG bike and pedestrian plans should utilize cores and corridors data to inform trail locations and connections.

Strategy 7: Protect drinking water sources.

Restore and protect the Edisto River and Shaw Creek, as they are both drinking water sources.

Strategy 8: Convert the abandoned rail line in Blackville into a Rails to Trails Greenway.

Apply for funding to convert an abandoned rail line in Blackville into a Rails to Trails Greenway. Additionally, Aiken, Barnwell, and Bamberg counties should collaborate to convert the entire abandoned line from Branchville to Aiken into a 60-mile regional Rails to Trails Greenway project to attract tourists and offer local access to a valuable recreational amenity. The federal Infrastructure Law includes funding for transportation alternatives, such as hiking and biking trails.

Strategy 9: Use natural assets' data and maps to guide zoning.

Rural communities in the region should consider establishing zoning guided by habitats cores, corridors, and agricultural soils data to protect these natural assets. Counties should create zoning overlay districts for important corridors to require wider buffers and other means of restoration and protection of the corridors.

Strategy 10: Protect God's Acre Healing Springs.

God's Acre Healing Springs in Blackville is valued by the community for its clean and healing drinking water. The site was deeded to God after its former owner's death and a plan for legal protection of the site is needed.

Strategy 11: Include wildlife crossings as culverts are replaced.

As road culverts across the state are replaced, incorporate wildlife crossings to increase connectivity for wildlife.

Strategy 12: Develop a tourism and recreation plan for Bamberg County.

Bamberg County has plentiful natural assets and ecotourism, but lacks tourism infrastructure, such as hotels and restaurants. Develop a Tourism and Recreation Plan for the county using the asset maps and data from the Green Infrastructure Plan as a foundation.

Strategy 13: The City of Orangeburg will continue to use tree canopy assessment data to plan for green infrastructure.

Orangeburg received a technical support grant from the SCFC for an urban tree canopy assessment and planning. The city will use this data to meet tree canopy goals, prioritize new tree plantings, guide their Comprehensive Plan update, and integrate trees into stormwater planning.

Strategy 14: The City of North Augusta will continue to use tree canopy assessment data to plan for green infrastructure.

The City of North Augusta received a technical support grant from the SCFC to receive an urban tree canopy assessment and planning assistance. The city will use these data to meet tree canopy goals, educate the community, and update ordinances.

Next Steps

The data created for this plan are a foundation upon which to build a detailed local Green Infrastructure Plan. Any municipality or county wishing to pursue a more detailed local plan should contact GIC.

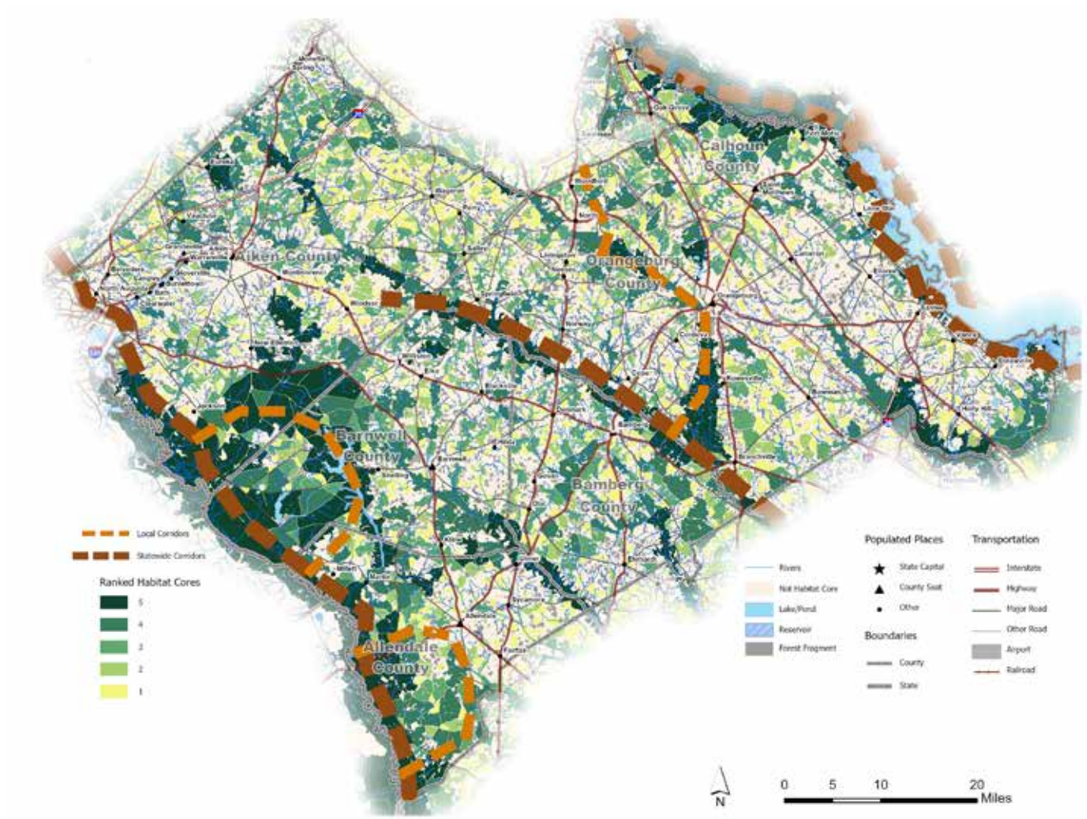
The purpose of this project was to identify and prioritize those green infrastructure assets that most urgently require protection or restoration in the state. The strategies and maps of habitat cores, corridors, assets, risks, and priorities provide a roadmap and shared vision for conservation and restoration efforts of state agencies, counties, cities, and landowners. Moving forward, agencies, planners, and citizens can view and download these priorities, maps, and data through the HUB site GIC has created in partnership with Esri. Additionally, the GIS datasets have been disseminated to all the agencies, municipalities, and organizations involved in this project to use in land use decisions and conservation planning. https://scgiplan-gicinc.hub.arcgis.com/

God's Acre Healing Springs in Blackville is valued by the community for its clean and healing drinking water.

Maps

View all these maps on line and download habitat core data at:
https://scgiplan-gicinc.hub.arcgis.com/

Lower Savannah Strategic Planning Map: Ranked Habitat Cores and Corridors



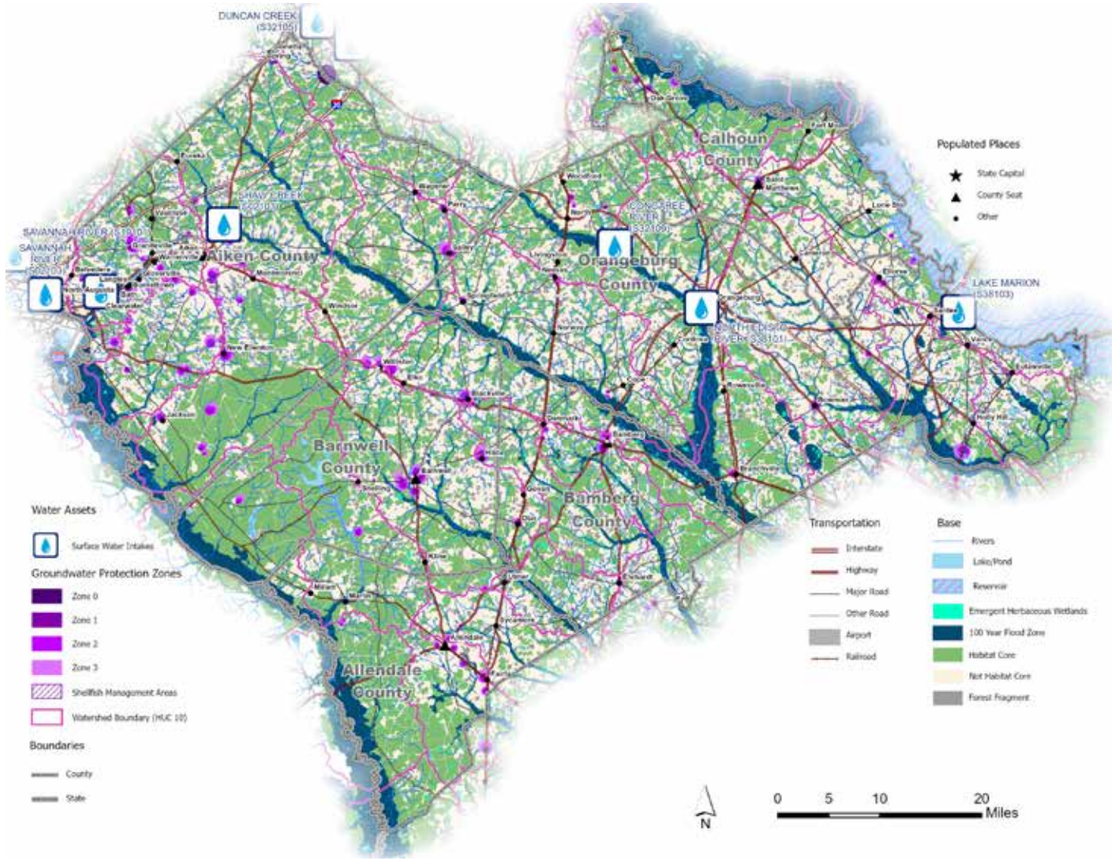
Habitat cores are intact natural landscapes large enough to support interior forest or marsh dwelling species. This map depicts the region's habitat cores and shows them connected by corridors to form a network. The more connected the landscape, the more resilient it is and the more pathways there are for people, pollinators, and plants. The habitat cores are ranked based on ecological metrics, with dark green representing the highest quality habitat cores and yellow representing the lowest quality habitat cores. A ranking of 5 is the best and 1 is the lowest. Additionally, statewide and regional wildlife corridors are represented on this map by brown dashed lines.

Lower Savannah Assets: Agriculture Map

This map identifies the highest quality agriculture soils (classes 1 and 2) on open land, as well as agricultural easements in the region.

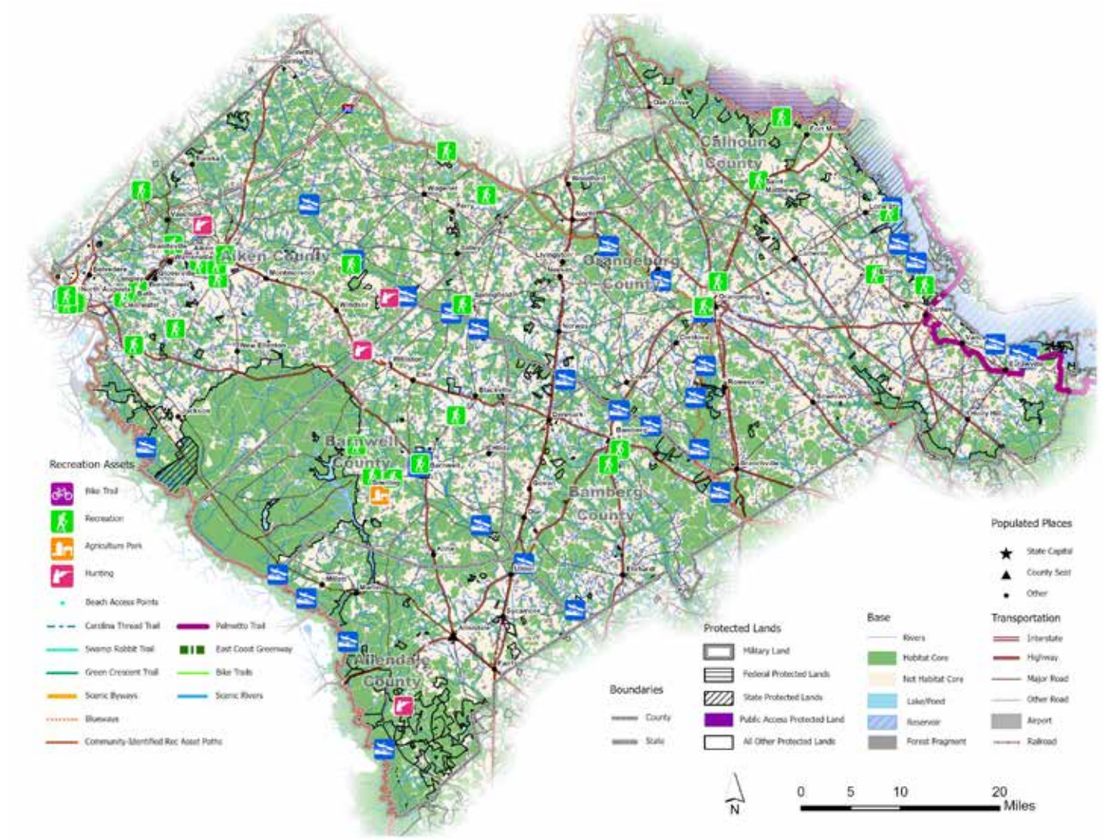
Lower Savannah COG

Lower Savannah Assets:
Water Map



This map depicts drinking water reservoirs, surface water intakes, groundwater protection zones, and the 100-year floodplain in the Lower Savannah region. The many forests and wetlands in the region help cleanse runoff to protect surface water quality and provide groundwater recharge.

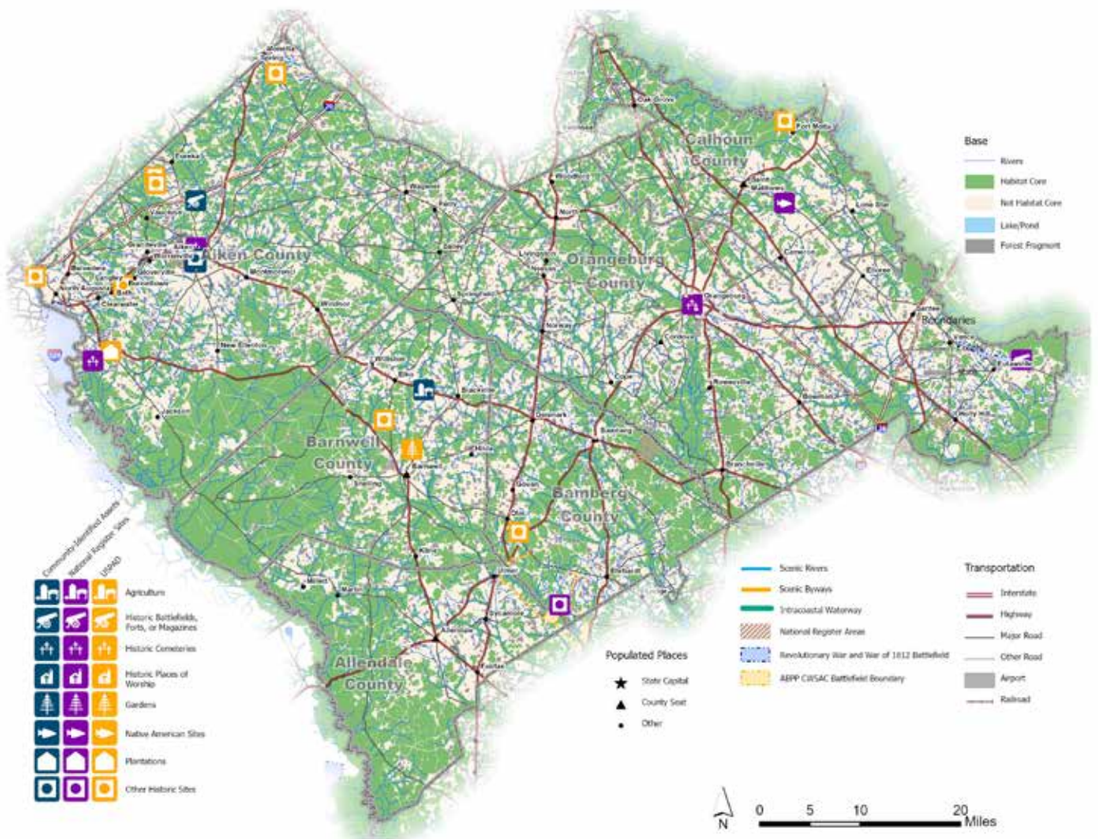
Lower Savannah Assets:
Recreation Map



This map depicts boat ramps, blueways, scenic rivers, scenic highways, greenways, Wildlife Management Areas, and federal, state, and local parks over 10 acres in the Lower Savannah region. Many recreational activities depend on a healthy landscape for their enjoyment, such as hiking, birding, boating, fishing, hunting, and other nature-based sports. A healthy landscape provides both access and scenic settings for enjoying the outdoors. Large intact habitats provide refuge, shelter, and food for the many species that residents and tourists appreciate when enjoying the outdoors.

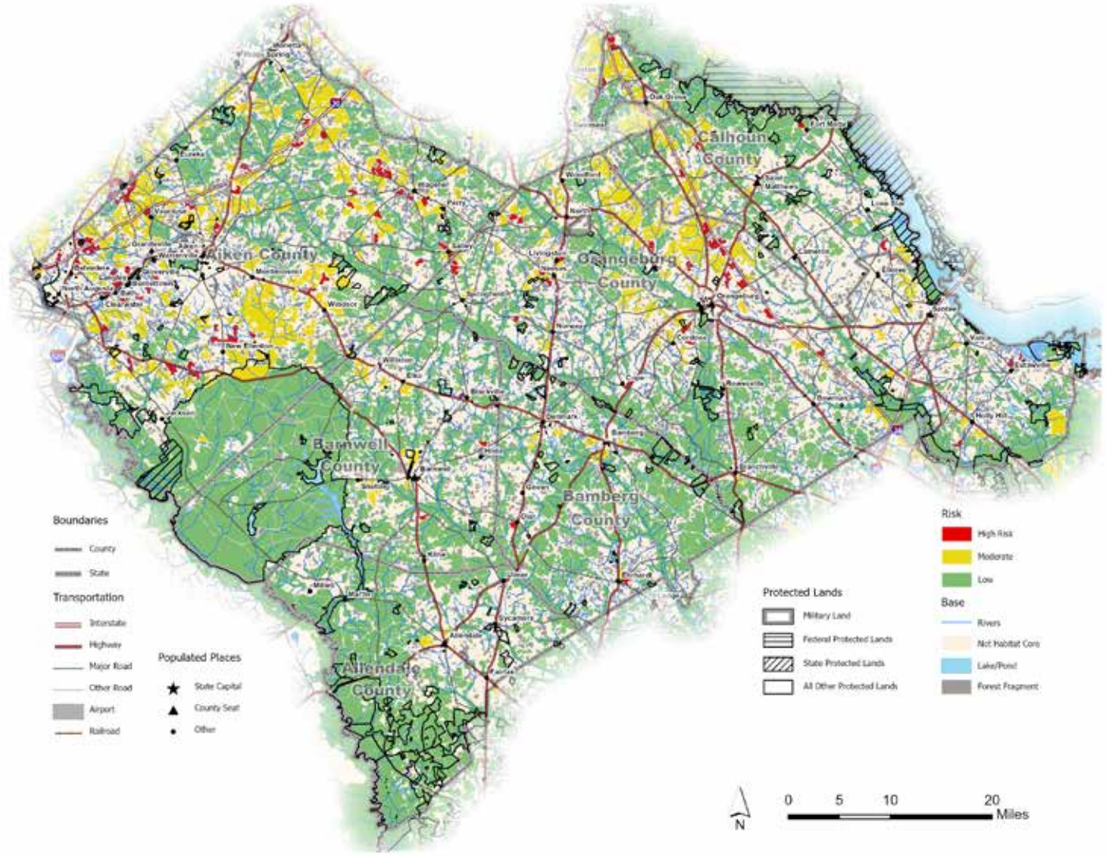
Lower Savannah COG

Lower Savannah Assets:
Culture Map



This map displays historic sites, Native Peoples sites, cultural overlay districts, scenic highways, scenic rivers, and waterfalls in the Lower Savannah region. Natural landscapes provide the context, backdrops, and buffers for these sites and contribute to their settings and beauty.

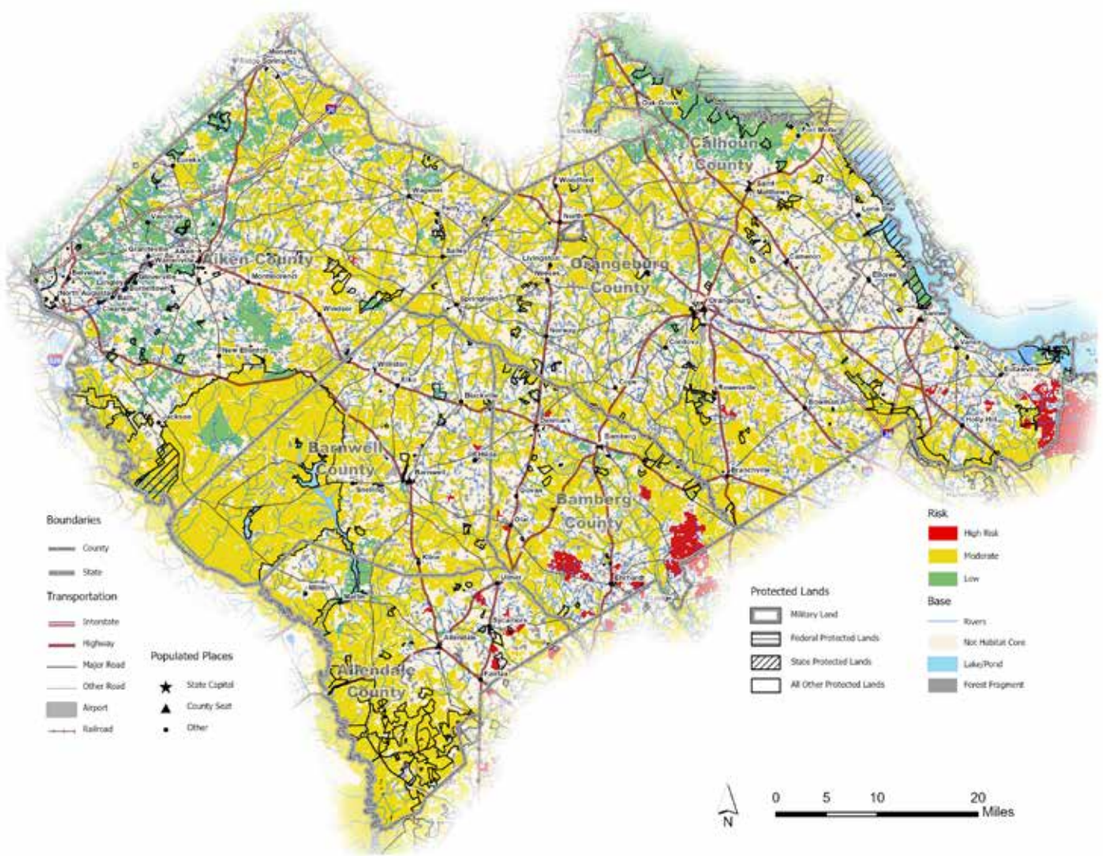
Lower Savannah Risks:
Development Risk Map



This map depicts the level of development risk based on the SLEUTH Urban Growth Model projected to the year 2060, with protected lands excluded.

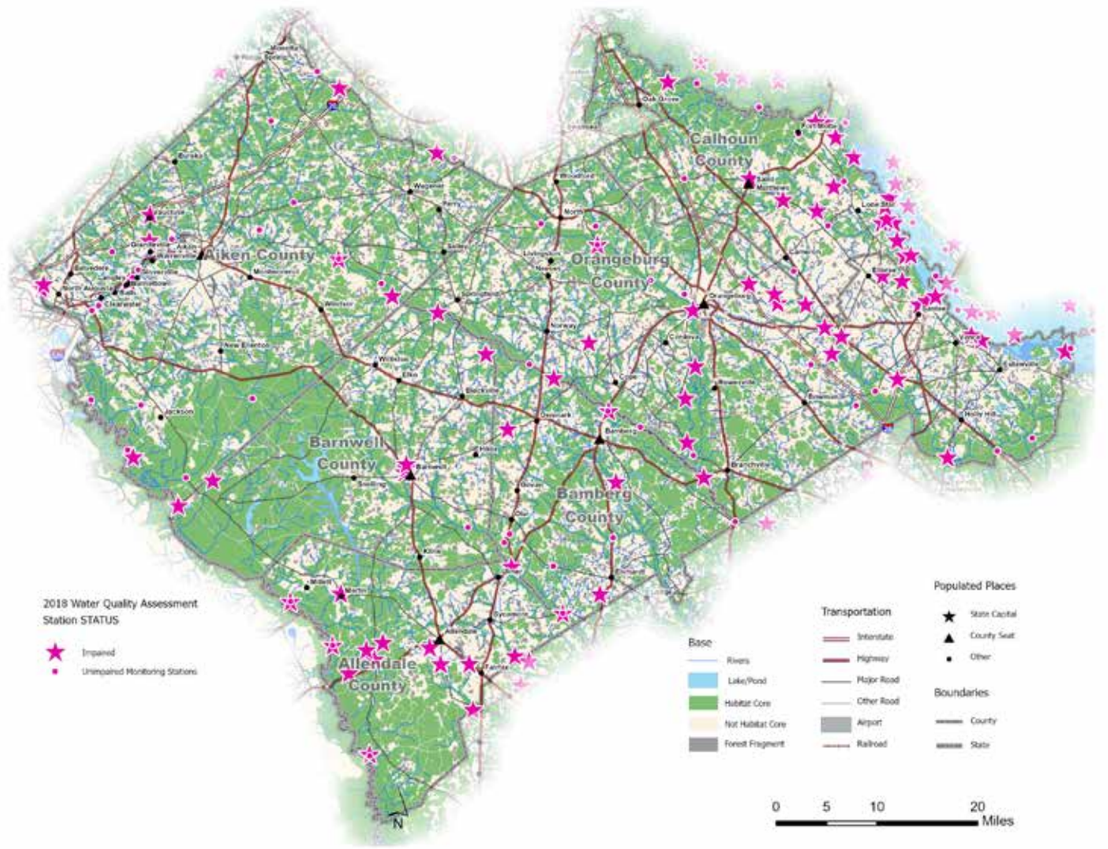
Lower Savannah COG

Lower Savannah Risks:
Solar Development Risk Map



This map depicts the level of solar development risk based on Argonne Lab's Solar Site Suitability Analysis, with wetlands and protected lands excluded.

Lower Savannah Risks:
Water Quality Impairments Map



This map depicts water quality assessment sites and specific impairments across the region, and includes SC DHEC Water Quality Assessment data.

Notes

*Native people of the Lower Savannah region as shown on Native Land Map:
Disclaimer from https://native-land.ca/
This map does not represent or intend to represent official or legal boundaries of any Indigenous Nations. To learn about definitive boundaries, contact the nations in question.

Acknowledgments

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